

# Combat Identification

## *Proven technology to be transferred To the Future Combat Systems*

by Major Gregory B. Gonzalez

Despite improvements in situational awareness made possible through digital technology, today's modern, mounted warrior is as likely to accidentally injure or kill his fellow warfighter during combat as were his World War II or Operation Desert Storm predecessors.

How is this possible? The short answer is that the advantages of increased situational awareness are often offset by the pace and difficulty of modern warfare. The risks and opportunities for fratricide continue to rise as military operations increasingly are conducted with distributed forces at a high operational tempo, during limited visibility, and over an expanded battlespace. This fact is validated by insights from the Division Capstone Exercise, Phase I (DCX I), conducted at Fort Irwin, California, in April 2001.

DCX I demonstrated the combat capabilities of the 2d Brigade Combat Team and the 4th Aviation Brigade, 4th Infantry Division (M), given advanced digital technologies and warfighting concepts.

During DCX I, 4th ID warfighters had the advantage of increased situational awareness made possible through use of the Force XXI Battlefield Command Brigade and Below (FBCB2) system and the advantage of higher visual resolution in their weapon sights by using 2d generation forward-looking infrared radar (SGF), yet these systems alone were insufficient to significantly reduce ground-to-ground fratricide.

The FBCB2 data latency, or the lag time between updates in the friendly situational database, is at best 10 seconds. This is the most frequent refresh rate possible using the system filter. Additional delays are caused by limited throughput of the tactical internet. In all, average FBCB2 data latency can be close to a minute or more. One additional problem is that gunners cannot see the FBCB2 screen while looking through their weapon sights. For these

reasons, a system designed to increase situational awareness will not adequately meet a requirement to identify friendly targets in real time at the point of engagement.

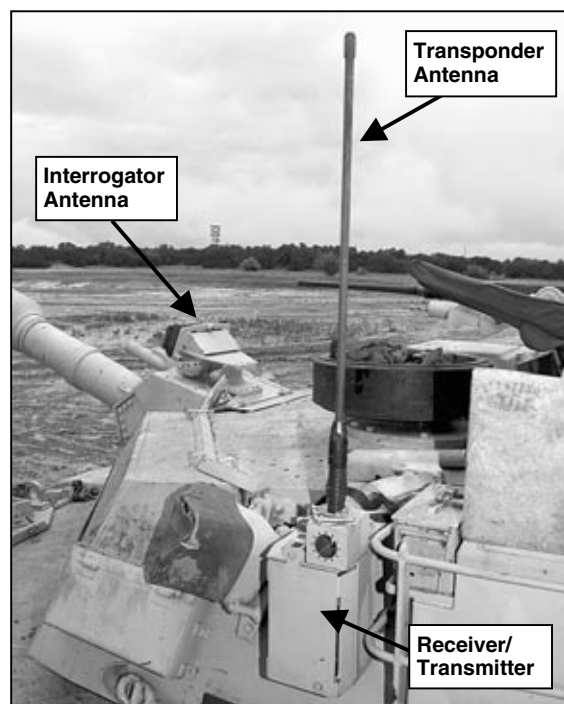
The SGF optics, while a great improvement over previous optics, still leave room for human error in target identification. Something more is needed to positively identify targets.

The DCX I Initial Insights Memorandum states that situational awareness gained by the Army Battle Command System (ABCS), which includes FBCB2, helped to avoid some potential fratricide incidents; however, fratricide still occurred. The types of fratricide that occurred included elements entering friendly minefields, direct fire ground-to-ground, ground-to-air, and air-to-ground incidents, and indirect fire incidents.<sup>1</sup> In all, troops participating in DCX I committed a total of 14 direct fire fratricides against 20 vehicles, resulting in 68 American casualties. In fact, fratricide was a significant enough problem during DCX I that one of the Initial Insights Memorandum's preliminary recommendations was to develop and field a dedicated interrogation friend or foe (IFF) capability for combat platforms.<sup>2</sup>

Because total friendly casualty figures were not collected during DCX I, it is not possible to list the DCX I fratricide casualties as a percentage of the whole, but historically fratricide rates during combat average between 10 and 17 percent. During World War II, 15 percent of American casualties re-

sulted from fratricide. During Grenada the total was 13 percent, and 12 percent in Panama.<sup>3</sup> During Desert Storm, the Army experienced its highest rate of fratricide since World War II — 17 percent.<sup>4</sup>

Although fratricide has been around as long as armed conflict itself, little effort was made to create a materiel solution designed to limit its occurrence until 1991. In the aftermath of Desert Storm, the Army leadership developed a requirement and began research for a through-sight, real-time, positive target identification capability, which when combined with increased situational awareness, more powerful optics, and improved tactics, techniques, and procedures, would reduce the likelihood of combat crews firing on friendly vehicles. The Battlefield



Above, the BCIS installed on an M1A1D for an initial operational test and evaluation.

Combat Identification System (BCIS) was developed in response to that requirement.

BCIS is a question and answer system, which uses millimeter wave technology to identify friendly vehicles in less than a second, out to a range of 5,500 meters. BCIS provides gunners and vehicle commanders critical information at the point of engagement in support of their shoot-or-don't-shoot decision and is enabled when the gunner activates the Bradley or Abrams laser rangefinder. Because BCIS is interlinked with current firing procedures, its use causes no additional steps for gunners and does not increase engagement times.

BCIS sends an encrypted query to the targeted vehicle. If the target is equipped with BCIS, the gunner taking aim will hear the words, "FRIEND, FRIEND, FRIEND" and he will see a flashing red dot in his sight. If the targeted vehicle is not equipped with BCIS, the gunner will receive the response, "UNKNOWN, UNKNOWN, UNKNOWN."

In September 2001, BCIS participated in an initial operational test and evaluation (IOT&E) conducted by the U.S. Army Operational Test Command (OTC) at Fort Hood, Texas. The test was to confirm that the system performs as designed in the hands of soldiers in a live-fire situation before being fielded. One BCIS-equipped M1A1D company from 3-66 Armor, 4th ID, and one BCIS-equipped M2A2 company from 2-7 Cavalry, 1st Cavalry Division, conducted gunnery on a crew reaction course arrayed with hostile, friendly, and coalition targets. Most friendly and select coalition targets were equipped with BCIS receiver/transmitters for positive identification.

Each vehicle and crew that participated in the test conducted a maximum of 10 day and 10 night engagements. Each engagement consisted of two to four targets at distances ranging from 1 to 4 kilometers. Fratricide data collected from the BCIS-equipped units has been compared against data collected on baseline (without BCIS) units from the same two battalions to determine the BCIS's effectiveness in reducing fratricide. In addition, OTC collected reliability, availability, and maintainability data on BCIS for analysis.



Above, an M1A1D Abrams tank, and below, an M2A2 Bradley Fighting Vehicle, each equipped with BCIS, engage targets during initial operational test and evaluation.



At the time this article was submitted for publication, the Army Test and Evaluation Command (ATEC) had not released the final version of the operational test report. However, preliminary results contained in the draft report are quite positive and indicate that BCIS is potentially operationally effective when forces are completely equipped with BCIS, it is suitable for soldier use, and is survivable in an operational environment. The operational test demonstrated that Bradley and Abrams crews are far less likely to shoot friendly combat platforms if those platforms are equipped with BCIS.

In September 2001, the Army zeroed all funding for the BCIS program in Fiscal Year 2003 and beyond. As a result, BCIS will not be fielded on M1A1/A2 Abrams tanks or M2/3A3 Bradley Fighting Vehicle variants. This difficult decision was the result of a reprioritization of Army funding required to pay for such critical programs as the Interim Brigade Combat Teams and development of the Future Combat Systems (FCS).

Despite the funding cut, the Army remains committed to reducing fratricide. To this end, Army leadership has proposed that the BCIS millimeter wave technology be transferred to the Objec-

tive Force for possible embedment into the FCS. This technology will be considered as one of the prime candidate technologies to fulfill the combat identification requirement in the new FCS platforms.

## Notes

<sup>1</sup>Division Capstone, Exercise Phase I (DCX I) Initial Insights Memorandum (IIM), Department of the Army, April 2001, Appendix E, p. 6-1.

<sup>2</sup>Ibid., p. 6-4.

<sup>3</sup>Kenneth K. Steinweg, "Dealing Realistically with Fratricide," *Parameters*, Spring 1995, pp. 4-29. Available at: <http://carlisle-www.army.mil/usawc/Parameters/1995/steinweg.htm>

<sup>4</sup>"Fratricide: Reducing Self-Inflicted Losses," *CALL Newsletter No. 92-4*, April 1992. Available at: [http://www.adtdl.army.mil/cgi-bin/atdl.dll/call/92-4/a\\_call92-4.htm](http://www.adtdl.army.mil/cgi-bin/atdl.dll/call/92-4/a_call92-4.htm)

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